



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/049,524	02/13/2002	Mitsuru Uesugi	L9289.02116	4076
24257	7590	09/28/2005	EXAMINER	
STEVENS DAVIS MILLER & MOSHER, LLP 1615 L STREET, NW SUITE 850 WASHINGTON, DC 20036			CHANG, EDITH M	
			ART UNIT	PAPER NUMBER
			2637	

DATE MAILED: 09/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/049,524	Applicant(s) UESUGI, MITSURU	
	Examiner Edith M. Chang	Art Unit 2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>20020213</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. For the formality of the application under the present office practice, applicant(s) is required to replace "Claims" with "I or We Claim". "The Invention Claimed Is" (or the equivalent) before the Claims part of the specification of the instant application. See MPEP 608.01(m).

Claim Objections

2. Claims 1-14 are objected to because of the following informalities:

Claim 1, line 10: "a plurality of" should be "the plurality of".

Claim 2, line 2: "serial/parallel" is suggested changing to "serial to parallel";
line 3: "of transmit data" should be "of the transmit data"; line 4: "a plurality of" should be "the plurality of".

Claim 3, line 2: "means performs" should be "means further performs"; line 3: "a plurality of" should be "the plurality of".

Claim 9, line 11 & Claim 10, lines 4 & 11: "a plurality of" should be "the plurality of".

Claim 12, line 2: "parallel/serial" is suggested changing to "parallel to serial";
line 3: "a plurality of" should be "the plurality of".

Claim 13, lines 4 & 6: "a plurality of" should be "the plurality of".

Claim 14, lines 4 & 10: "a plurality of" should be "the plurality of".

Claims 4-8 and 11 are dependent on the objected claims 1 and 10.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-6 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. (US 6,243,565 B1).

Regarding to **claims 1 & 9**, In FIG.10, Smith et al. discloses an apparatus with its method for using diversity, wherein the tuneable transmitter 102 of FIG.10 is implemented equally as a plurality of transmitter elements 18 (column 14, lines 4-7) and a polarization selector and RF switch 124 (column 14, lines 58-63) is coupled to dual-polarized antennas, however, Smith et al. does not show the detail of the equivalent implementation or embodiment of the plurality of transmitters of the tuneable transmitter in FIG.10.

In FIG.4, Smith et al. discloses the equivalent implementation (or embodiment) of the plurality of transmitters of the tuneable transmitter. At the time of the invention was made, it would have been obvious to one of ordinary skill in the art to replace the RF switch 24 of FIG. 4 by the polarization selector and RF switch 124 of FIG10 as stated in column 14, lines 58-63, to gain one more type of signal diversity, the polarity diversity (column 15, lines 15-16), for overcoming the effects of multi-path fading (column 4, lines 47-51).

The combined/modified Smith et al.'s apparatus (FIG.4 & FIG.10) comprises the base-band switch 84 (as the *distributing means*) and transmitters 18 (as *radio transmitting means*) for distributing the signal from the info signal source 14 to the n transmitters 18 (column 9, lines 42-47).

Regarding to **claim 2**, the combined/modified Smith et al.'s apparatus (FIG.4 & FIG.10) discloses the base-band switch 84 performing serial to parallel conversion.

Regarding to **claim 3**, the combined/modified Smith et al.'s apparatus (FIG.4 & FIG.10) discloses diversity branches by transmitters 18.

Regarding to **claim 4**, the combined/modified Smith et al.'s apparatus (FIG.4 & FIG.10) discloses the frequency diversity (column 3, lines 54-56; column 13, lines 64-67) via transmitter frequency 1 to transmitter frequency n.

Regarding to **claim 5**, the combined/modified Smith et al.'s apparatus (FIG.4 & FIG.10) discloses the time diversity (column 3, lines 16-19 & column 15, lines 15-16).

Regarding to **claim 6**, the combined/modified Smith et al.'s apparatus (FIG.4 & FIG.10) discloses the space diversity via multiple antennas 106 and 44.

Regarding to **claim 8**, the combined/modified Smith et al.'s apparatus (FIG.4 & FIG.10) discloses the polarization diversity via the polarization selector 124 of FIG.10.

Regarding **claim 15**, according to any one of claim 1 through 6 or claim 8, Smith et al. discloses the system 10 forms a base station (column 7, lines 12-18).

Art Unit: 2637

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. (US 6,243,565 B1) as applied to claim 1 above, and further in view of Reudink (US 5,563,610).

Regarding to **claim 7**, Smith et al. does not explicitly specify the angular diversity, however, Reudink teaches the angular diversity in the CDMA receiving system FIG.5 and FIG.6 via the narrow beam antennas as shown in FIG.1A and FIG.1B, wherein the antennas aim to different angles (column 4, lines 60-62). At the time of the invention was made, it would have been obvious for one of ordinary skill in the art to have the angular diversity taught by Reudink in Smith et al.'s system that the antennas aiming to different angles so the number of antennas can be reduced and the need to space antennas by the substantial distances can be eliminated (column 2, lines 25-32) for a more compact and less complicated system to reduce fading.

Regarding **claim 15**, according to claim 7, Smith et al. discloses the system 10 forms a base station (column 7, lines 12-18).

6. Claims 10-14, 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wallace et al. (US 6,473,467 B1) in view of Nobakht (US 6,009,120).

Regarding to **claims 10 & 14**, in FIG.6, Wallace et al. discloses a receiving apparatus with its method (column 24, lines 25-28) comprising: FRONT END PROCESSORS 612A-612R (as the radio receiving means) receiving multiple sequences of data from the antennas (column 24, lines 35-38); DEMUX & COMBINERS 620 (as the combining means) combining the received multiple sequences of data; and

Art Unit: 2637

CHANNEL PROCESSORS 630A-630R and DECODERS 640A-640R (as the demodulating means) performing demodulator functions (column 25, lines 12-16) and error correcting (column 25, lines 23-30).

However, Wallace et al. does not specify performing equalization and error correction simultaneously. Nobakht teaches multi-dimensional combined equalizer and decoder 70 in FIG.1 that simultaneously equalized and decoded the received signals by the MULTI-D EQUALIZER/DECODER 70 (column 3, lines 33-38 '120). As Wallace et al. transmitting and receiving over multiple channels, at the time of the invention was made, it would have been obvious for one of ordinary skill in the art to have the multi-dimensional combined equalizer and decoder taught by Nobakht replacing the Wallace et al.'s decoders in order to handle multiple symbols received over multiple channels (column 2, lines 36-41 '120) for accommodating the high data rates communication (column 2, lines 14-20 '120).

Regarding to **claim 11**, in FIG.6, Wallace et al. discloses the radio receiving means (FRONT END PROCESSORS 612s) receiving data via multiple antennas (column 24, lines 25-33).

Regarding to **claim 12**, in FIG.6, Wallace et al. discloses the DEMUX & COMBINERS 620 performing parallel and serial conversion (column 24, lines 54-61).

Regarding to **claim 13**, in FIG.6, Wallace et al. discloses the FFTs (as the correlation monitoring means) for monitoring the association (the correlation) of fading distortion in signals received from the FRONT END PROCESSORS (column 24, line 38-42) wherein the coherent samples associated with the received pilot are provided to

Art Unit: 2637

FFTs to generate transformed representative of the received signals (column 24, lines 43-45).

Regarding to claims **16 & 18**, according to any one of claim 10 through 13, Wallace et al. discloses the receiver apparatus of the base station (column 4, lines 48-53) and the subscriber units (as communication terminals, column 4, lines 64-67).

7. Claim 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. (US 6,243,565 B1) as applied to any one of claim 1 through claim 6 or claim 8 above, and further in view of Bantz et al. (US 5,507,035).

Regarding claim 17, Smith et al. discloses a communication station 10, however does not specify the communication terminal apparatus. Bantz et al. teaches the diversity techniques used at both a stationary unit such as a base station and a mobile station in a cooperative way (column 2, lines 9-12 '035). At the time of the invention was made, it would have been obvious for one of ordinary skill in the art to have the diversity techniques taught by Smith et al. implemented in the mobile station (as the communication terminal) as well to both transmit and receive antenna diversity techniques dynamically combined and coordinate in the base station and the mobile terminal to combat the multipath fading phenomena in a wireless radio communications system (column 1, lines 64-67 '035).

Art Unit: 2637

8. Claim 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. (US 6,243,565 B1) in view of Reudink (US 5,563,610) and as applied to claim 7 above, and further in view of Bantz et al. (US 5,507,035).

Regarding claim 17, Smith et al. discloses a communication station 10, however does not specify the communication terminal apparatus. Bantz et al. teaches the diversity techniques used at both a stationary unit such as a base station and a mobile station in a cooperative way (column 2, lines 9-12 '035). At the time of the invention was made, it would have been obvious for one of ordinary skill in the art to have the diversity techniques taught by Smith et al. implemented in the mobile station (as the communication terminal) as well to both transmit and receive antenna diversity techniques dynamically combined and coordinate in the base station and the mobile terminal to combat the multipath fading phenomena in a wireless radio communications system (column 1, lines 64-67 '035).

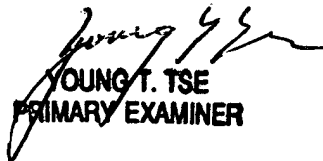
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edith M. Chang whose telephone number is 571-272-3041. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay K. Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2637

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Edith Chang
September 26, 2005


YOUNG T. TSE
PRIMARY EXAMINER